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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/041,896

01/07/2002

Brenda D. Kraus

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7590

01/28/2004

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SPOKANE, WA 99201

EXAMINER

HUYNH, YENNHU B

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 01/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,896

Applicant(s)

KRAUS ET AL.

Examiner

Yennhu B Huynh

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-23, 25, 28, 65, 67, 68, 70, 71, 74 and 75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-23, 25, 28, 65, 67, 68, 70, 71, 74 and 75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11, 14, 18&3 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the Amendment filed on 11/20/03.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/20/03 has been entered.

Claims 1-20, 29-41, 57-63, 42-56 are cancelled by the Amendments filed on 4/16/02, 5/13/02, 2/12/02.

Claims 24, 26, 27, 64, 66, 69, 72 & 73 are cancelled by the Amendment filed on 11/20/03.

Currently, claims 21-23, 25, 28, 65, 67, 68, 70, 71, 74 & 75 are pending.

Information Disclosure Statement

The information disclosure statement filed on 12/30/02, 5/29/03, 8/27/03 and 11/20/03 are reviewed by the examiner.

Oath/Declaration

Oath/Declaration filed on 01/07/02 is accepted.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 21,22,25,67,74 & 75 are rejected under 35 U.S.C. 102(e) as being anticipated by Krause et al. (U.S. 6,218,293B1).

Krause et al. at figs. 1-3 in related text cols. 1-8 disclose formation of a semiconductor device, which include:

-Re. claims 21,22,25,67,74 & 75: an array of word lines forming gate of FET 18, and array of bit line region 30, individual FET comprising a pair of source/drain region 12; a plurality of memory cell storage capacitor associated with the field effect transistors, individual storage capacitors comprising a first capacitor electrode 40 in electrical connection with one of a pair of source/drain regions 12, of one of the FETs,

and a second capacitor electrode 44, a capacitor dielectric region 24/42; the region received intermediate the first and second capacitor electrodes, the region of capacitor dielectric comprising/consist of aluminum nitride layer 24/42, and the capacitor dielectric region having a thickness less than or equal to 60 Angstroms (50Angstroms); the other of the pair of source/drain regions 12 of the one field effect transistor being in electrical connection with one of the bit lines 30; wherein the bit lines are received elevationally outward of the memory cell storage capacitors (figs.2, col. 4, lines 1-56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23, 28, 65, 68, 70 & 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. 6,218,293B1) in view of Liu et al. (Surface of Science 320, 1994, pp. 145-160).

Krause et al. disclose substantially all of claimed invention, but do not disclose wherein the capacitor dielectric region consists essentially of aluminum nitride and native oxide formed on at least one of the first and second capacitor electrodes (cls. 23,65,70 & 71).

Re. claims 23,65,70 & 71: Liu et al. the surface chemistry of AlN MOCVD on alumina, which includes aluminum nitride for semiconductor structure that bonded to a

native oxide formed in dielectric region (p. 152, left col., last Para.; and right col., middle Para.).

It would have been obvious to one having skill in the art at the time the invention was made to combine Krause et al. invention by incorporation aluminum nitride bonded native oxide, to obtain a thin film insulator at high temperature by its electrical properties.

Krause et al. also do not disclose wherein the AlN is substantially amorphous (cls. 28 & 68).

-Re. claims 28 & 68: Liu et al. also disclose wherein the AlN film is substantially amorphous (p.146, left col., first paragraph).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Krause et al. invention by incorporation amorphous AlN material film to reduce carbon and oxygen, in order to prevent current leakage problem.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu B Huynh whose telephone number is 703-308-6110 (and the new telephone number 571-272-1692 will be effected from 2/5/04). The examiner can normally be reached on 8.30AM-7.00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-7724.

Yennhu B. Huynh,
Examiner,
012604

